

Final Report

Project #14-1739, Upper Peshastin Barrier Conceptual Design

Submitted by Sofia Bjorklund on 05/19/2017

Accepted by Marc Dubois on 05/22/2017

CONTACTS

Primary Sponsor: Chelan Co Natural Resource**Lead Entity:** Upper Columbia Sal Rec BD LE**Managing Agency:** Rec. and Conserv. Office**Project Contact:** Pete Cruickshank
pete.cruickshank@co.chelan.wa.us**Alt Project Contact:** Mike Kane
kanenaturalresources@gmail.com
Jennifer Hadersberger
Jennifer.hadersberger@CO.CHELAN.WA.US
Michael Kaputa
mike.kaputa@co.chelan.wa.us**Billing Contact:** Sofia Bjorklund
sofia.bjorklund@co.chelan.wa.us**RCO Grant Manager:** Marc Dubois
marc.dubois@rco.wa.gov

DESCRIPTION OF THE COMPLETED PROJECT

Project Start Date: 12/04/2014**FundingEnd Date:** 03/31/2017**RCO Closure Date:**

This is Phase One of a proposed three phase project. Phase 2 will be the development of preliminary and final designs and Phase 3 construction. At this point we are on hold from executing Phase 2, citing a lack of landowner willingness to identify any of the alternatives that would result in a feasible path forward for Phases 2 & 3. That said, it is of the opinion of CCNRD and its agents, as well as WDFW staff working collaboratively on this project that as more fish data is collected through State efforts, the landowner opposition of Phases 2 & 3 will subside and the overall project will move forward. As of this writing, WDFW has installed additional detection infrastructure around this site (not captured here due to timing constraints) and has undertaken more field efforts to document fish use of this and upper reaches of Peshastin Creek.

The goal of the overall project is to improve steelhead access to the upper reaches of Peshastin Creek. Project objectives for Phase One included, identifying species of fish, size range and migration timing, collecting data including: topographical survey, water surface elevations, geomorphic conditions and velocities. Deliverables within this report include hydraulic models with velocities and depths, calculated fish passability, conceptual designs and cost estimates based on the passage assessment and geomorphic assessment. As part of the deliverables which phases 2 & 3 rely upon stakeholder input and their selected preferred alternatives are included as well.

SITE LOCATION

General Area of Project: Upper Peshastin, along US 97**Waterbodies:**

Cong District 2012: 08
County: Chelan
HUC: Wenatchee
Leg District 2012: 12
Salmon Recov Reg 05: Upper Columbia
Section: 36
Township/Range: T23NR17E
WAU: Blewett
WRIA: Wenatchee

Sponsor Clarifications:

PROJECT NARRATIVE

The lower nine miles of Peshastin Creek is generally wide and unconfined, but at RM 9.2 the creek enters a narrow floodplain defined by canyon walls and State Route 97. At RM 10.4 (just upstream of Ruby Creek) there is a large slide on the left canyon wall (Figure 7). A detailed geologic report of the site history and current conditions is provided in Appendix B of the attached report. The report documents that the landslide has been active for the last 95 years, and a series of highway relocation and channelization projects have occurred. The most recent work was in 1996. Since that time the overall landslide has been stable but slope and toe erosion has occurred.

Two topographic surveys were conducted. The horizontal and vertical datum was assumed. The first survey was done on November 2, 2015 at a flow of 60 cfs. Some of the deep pools were difficult to reach and the intent was to return in summer 2016 to complete detailed low flow portions of the survey. On November 17, 2015 and December 9, 2015 the site experienced floods at approximately the 15 year peak flood event. Based on observations from a March 2, 2016 field trip comparing photos it became apparent the bed has shifted as much as 4 feet vertically in some areas. Several major boulders used as reference points had moved and the drop/turbulence in some areas was very different. At this point it was very apparent that the baseline bed conditions as surveyed at low water during 2015 were no longer valid as the flood event had drastically altered many points of bed geometry within the 1000' reach. RCO Grant Manager was alerted to this shift and a request was made to push out the final deliverables to allow for the collection of another survey to re-capture bed conditions. The extension was granted, but with a caveat that the report would need to be finished with preferred alternatives determined by necessary stakeholders before the next Salmon Recovery Board proposal deadline. A second survey was completed on July 15, 2016. The flow was only 15 cfs. The focus of the survey was to redo the changed portions and extend the survey further downstream.

A one-dimensional hydraulic model was developed for the site using HEC RAS Version 5.0.3. The reach length modeled was 600 feet. Flows were modeled from 30 to 1367 cfs. The model was calibrated at measured site flows and water surface elevations of 250 and 920 cfs. A Manning's n of 0.2 was used to match the measured water surface elevations. Detailed output is provided in Appendix D of the attached report.

Fish passage through natural and disturbed channels should be based on an assessment of the stream and watershed condition, comparing drop, velocity and turbulence to fish jumping and swimming abilities and local knowledge and actual documentation of fish passage from redd counts and tagging studies. For this site, since redds have been counted upstream and fish have been detected moving upstream, the intent of the passage assessment is not to look at whether the site is a barrier, but more a degree of difficulty rating based on site conditions. From the hydrology section it was determined to assess fish passage at flows of 30, 100 and 210 cfs.

Developing conceptual design options for this reach of Peshastin Creek is very challenging due to the slope stability issues, confined channel and the gradient. The overall geomorphic and anthropogenic processes creating the passage problem can be boiled down to two items, 1) channel aggradation from the frequent input of sediment/large boulders from the active slide area due to the confinement between the riprap revetment constructed to protect the highway, and 2) the bedrock knob downstream which has confined the channel vertically and horizontally and reduces the potential for regrade. These two items create increased slope downstream, resulting in decreased pool depth at low flow and increased turbulence at higher flows. The channel cannot create scour/pools due to the size and number of boulders in the channel which have accumulated over time.

In the end, 6 alternative conceptual designs were developed, ranging from no action to extensive restoration of the entire reach including toe stabilization of the Ruby Slide slope. The design engineer worked with WDFW to develop a low-cost design, citing possible resistance to some of the more heavy handed and expensive designs. This became option 1 and was WDFW's preferred option. WSDOT did not submit a preferred option, but expressed their interest in ensuring Highway 97 roadway prism as well as follow up questions. WSDOT representatives indicated a neutral stance on eventual projects as long as the highway was not impacted, and had positive inputs on how to tackle construction access to the site. The USFS chose to only support alternative 0, which is no work on Peshastin Creek, citing risk and project longevity in relation to cost. Please see Appendix C of the attached reports to review stakeholder preferred alternative narratives.

It is of the opinion of Chelan County Natural Resources, its agents, as well as cooperative partners within WDFW that a viable restoration exists in this reach of Peshastin Creek to improve salmonid passage and open up high quality spawning and rearing habitat upstream for annual use. From the initial stakeholder coordination WSDOT expressed that they are not the primary landowner and would be deferring final Landowner Agreements to the USFS (even as Highway 97 right-of-way extends into Peshastin Creek) but was at least willing to provide helpful inputs and did not consider any proposed actions as fatal flaws. Coordinating with USFS became increasingly difficult as the local district faces many internal staffing issues, and additionally the staff available were not overly supportive of the project. USFS did express appreciation for the geo-technical analysis completed on the hill side, but in the end was not willing to change their position that any construction project was too expensive and risky in this location. While CCRD staff does not agree with the basis of USFS decision to weigh in on construction estimate costs or viability, it does respect that USFS is the primary landowner and needs to be on board to move into Phases 2 & 3. WDFW has committed to accumulating additional fish use data of Peshastin Creek, and specifically this reach with the collective hope that we may be able to change the minds of USFS with additional evidence supporting the intent of Phases 2 & 3.

AMENDMENTS

#	Type	Applied Date	Description
1	Time Extension	08/23/2016	The project period of 12/04/2014 to 12/04/2016 is extended to allow the contracting party until 03/31/2017 to complete the project.

OVERALL PROJECT COSTS

Funding Formula:	Requested		Original		Final	
Salmon State Projects:	\$62,500.00	(84%)	\$62,500.00	(84%)	\$58,156.61	(84%)
Sponsor Match:	\$12,000.00	(16%)	\$12,000.00	(16%)	\$11,166.07	(16%)
Total:	\$74,500.00	(100%)	\$74,500.00	(100%)	\$69,322.68	(100%)
Paid To Date:	\$58,156.61				Last Released Billing: 05/22/2017	
Remaining RCO Funds:	\$0.00				Pending Billing: No	
Advance Balance:	\$0.00		Match Bank:	\$5,177.32	Number of Billings: 8	
Admin Limit:	\$0.00		Admin Spent:	\$0.00		
A&E Limit:	\$0.00		A&E Spent:	\$0.00		

Billed Cost Summary:	Original Agreement	Expended	Non-Reimbursable	Total Billed
Non-Capital				
Non-Capital Costs		\$58,156.61	\$20,863.07	\$79,019.68
Equipment				
Non-Capital Total	\$74,500.00	\$58,156.61	\$20,863.07	\$79,019.68
Total	\$74,500.00	\$58,156.61	\$20,863.07	\$79,019.68

Project Cost Metrics:	Original Agreement	Final
PCSRF Federal Funds (A.10):		
State Funds (A.11):	\$58,156.61	\$58,156.61
Other Federal Funding:		
Pending Billing - RCO Share Approved:		
Retainage - RCO amount retained:		\$0.00
Amount of other monetary funding (A.12):	\$12,000.00	\$780.00
Project identifier for the other monetary funding (A.12.b):	Chelan County	
Source of other monetary funding (A.12.a):	N/A	CCNRD supported under BOR field monitoring grant field assistance and monitoring support to Project Design Engineer
Value of Donated Unpaid Labor (Volunteers) (A.13.a.2):	\$0.00	\$0.00
Source of Donated Un-paid labor contributions (A.13.a.4):	N/A	N/A
Number of hours volunteers contributed to the project (A.13.a.1):		0
Describe how the value of the volunteers was determined (A.13.a.3):		N/A
Value of Donated Paid Labor (A.13.b.1):	\$0.00	\$0.00
Source of Donated Paid Contributions (A.13.b.2):	N/A	N/A
Value of Other In-Kind Contributions (A.13.c.1):	\$0.00	\$20,083.00
Source of Other In-Kind Contributions (A.13.c.3):	N/A	WDFW Array equipment and install of array equipment in close proximity to project site to further develop fish usage and passage data.
Description of other In-Kind contributions (A.13.c.2):	N/A	N/A

PROJECT METRICS

	Original Agreement	Final
Completion Date		
Projected date of completion:	1/31/2017	03/31/2017 <i>Extension was granted through RCO grant manager Marc Duboiski to accommodate need for additional data collection following the high flow events during winter 2015/2016 which fundamentally changed bed conditions on the site as surveyed in summer 2015.</i>
Project Goals		
Goals, purpose, and expected benefits (A.17):	To identify whether a passage restoration project is geologically feasible before advancing the design process. If yes, then develop a conceptual design and select a preferred alternative, acceptable to the USFS and WSDOT.	To identify whether a passage restoration project was geologically feasible, then develop ceonceptual designs and identify preferred alternatives through coordination with stakeholders WSDOT, USFS, and WDFW. The primary species is ESA listed Steelhead.

WORKSITE #1: Peshastin Creek RM 10.4-10.6

Worksite Description: Peshastin Creek RM 10.4-10.6 below the Ruby Slide. Assessing fish passage.

Driving Directions: From intersection of SR 2 and US 97 proceed south on US 97 to Ruby Creek (USFS Road #7204). Turn onto Ruby Creek Road and park. Cross highway on foot to access Peshastin Creek.

Coordinates for Worksite Directions - Latitude: 47.45 **Longitude:** -120.66

Sponsor Clarifications:

Sponsor verified the above information is correct and complete.

WORKSITE #1 COSTS

Worksite Billed Cost:	Estimated	Expended	Non-Reimbursable	Total Billed
Non-Capital Costs	\$74,500.00	\$58,156.61	\$20,863.07	\$79,019.68
Worksite Total	\$74,500.00	\$58,156.61	\$20,863.07	\$79,019.68

Worksite Costs by Category:	Original Agreement	Final
Design for Salmon restoration Costs:	\$74,500.00	\$79,020.00

WORKSITE #1 METRICS

	Original Agreement	Final
Targeted salmonid ESU/DPS (A.23):	Steelhead-Upper Columbia River DPS	Steelhead-Upper Columbia River DPS
Area Encompassed (acres) (B.0.b.1):	1.0	1.0
Targeted species (non-ESU species):	Bull Trout, Rainbow	Bull Trout, Rainbow
Miles of Stream Affected (B.0.b.2):	0.20	0.20

Design for Salmon restoration

Preliminary design

Total cost for Preliminary design:	\$74,500.00	
	74500	
Name of the Plan:	Yakama Nation. 2010.Lower Peshastin Tributary and Reach Assessment. Prepared by Interfluver for Yakama Nation.	Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan, Several Authors, August 2007, http://www.ucsrp.org/Assets/Documents/Library/Plans/UCSRP/UCSRP%20Final%209-13-2007.pdf
	Yakama Nation. 2010.Lower Peshastin Tributary and Reach Assessment. Prepared by Interfluver for Yakama Nation.	

Description of the Plan:

The plan evaluates aquatic habitat conditions in lower Peshastin Creek.

The Upper Columbia Salmon Recovery Plan from August 2007 is for spring Chinook and steelhead. The Upper Columbia Salmon Recovery Board, a regional non-profit organization, implements the plan to restore viable and sustainable populations through collaborative, economically sensitive efforts, combined resources, and wise resource management. All recovery efforts are transparent and evolving. The plan is the culmination of several conservation efforts, including state and tribal-sponsored recovery efforts, subbasin planning and watershed planning. The plan is non-regulatory and does not force private landowner involvement. All implementation efforts are voluntary. The recovery plan covers the Upper Columbia River and six major "subbasins" (Crab, Wenatchee, Entiat, Lake Chelan, Methow and Okanogan basins). Currently there are three independent spring Chinook and five steelhead populations in the Upper Columbia. The recovery actions identified in the plan are for all four major sectors (Harvest, Hatcheries, Hydropower, and Habitat). Implementation of specific recovery actions are coordinated with local stakeholders to determine feasibility, including socio-economic interests, benefits and costs.

The plan evaluates aquatic habitat conditions in lower Peshastin Creek.

SPONSOR CERTIFICATION

- ☒ I certify that this project has been completed in accordance with the project agreement.
- ☒ I certify that, to the best of my knowledge, the information in the Final Report is true and correct.

Submitted by Sofia Bjorklund on 05/19/2017